

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A self-compensating laser resonator comprising:

a first reflecting apparatus having a first reflecting surface and a second reflecting surface disposed at a right angle to each other and intersecting at a first ridge line;

a second reflecting apparatus having a third reflecting surface and a fourth reflecting surface disposed at a right angle to each other and intersecting at a second ridge line, said second reflecting apparatus facing said first reflecting apparatus such that the first through fourth reflecting surfaces are facing each other; and

a laser medium provided between said first reflecting surface and said third reflecting surface; and

a light source for exciting said laser medium,

wherein the first ridge line is substantially orthogonal to the second ridge line where a laser beam emanating from said laser medium travels along an optical path to said first reflecting surface and is successively reflected, along an

optical path, by said first, second, third, fourth, second, first, fourth and third reflecting surfaces to again enter said laser medium, said laser medium being positioned with respect to said first and second reflecting apparatus so that three reflections occur without the laser beam emitted therefrom passing through the laser medium,

wherein the laser beam contains a P-polarization and an S-polarization component, said resonator further having a polarizing reflecting element for selectively allowing to pass a first portion of said P-polarization component and a second portion of said S-polarization component, where the non-passed portions are reflected, said polarizing reflecting element positioned in an optical path of said laser beam, and

further having a polarization component adjusting device for dividing said laser beam into said P-polarization component and said S-polarization component at an arbitrary ratio, said polarization adjusting device being positioned in an optical path of said laser beam.

2. (Currently amended) ~~A—~~The self-compensating laser resonator according to Claim 1 ~~having an~~, wherein an isolator, which allows said laser beam to pass in only one direction, is provided in an optical path of said laser beam.

3. (Currently amended) ~~A~~—The self-compensating laser resonator according to Claim 1, wherein a partially reflective mirror used for laser output is provided at any one of said first to fourth reflecting surfaces.

4. Cancelled.

5. Cancelled.

6. (Currently amended) A self-compensating laser resonator ~~according to Claim 1, having comprising:~~

a first reflecting apparatus having a first reflecting surface and a second reflecting surface disposed at a right angle to each other and intersecting at a first ridge line;

a second reflecting apparatus having a third reflecting surface and a fourth reflecting surface disposed at a right angle to each other and intersecting at a second ridge line, said second reflecting apparatus facing said first reflecting apparatus such that the first through fourth reflecting surfaces are facing each other;

a laser medium provided between said first reflecting surface and said third reflecting surface; and

a light source for exciting said laser medium,

wherein the first ridge line is substantially orthogonal to the second ridge line where a laser beam emanating from said laser medium travels along an optical path to said first reflecting surface and is successively reflected, along an optical path, by said first, second, third, fourth, second, first, fourth and third reflecting surfaces to again enter said laser medium, said laser medium being positioned with respect to said first and second reflecting apparatus so that three reflections occur without the laser beam emitted therefrom passing through the laser medium,

an isolator, for allowing said laser beam having a said P-polarization component and a said S-polarization component, to pass in only one direction, said isolator having two polarization component adjusting devices for selectively allowing to pass a first portion of said P-polarization component and a second portion of said S-polarization component while reflecting the non-passed portions, a Faraday rotator and a half wave plate; and

a polarization component adjusting device for dividing said laser beam into said P-polarization component and said S-polarization component at an arbitrary ratio.

7. (Currently amended) A ~~The~~ self-compensating laser resonator according to Claim ~~4, where 1,~~ wherein said polarization component adjusting device is a half wave plate.

8. (Currently amended) A ~~The~~ self-compensating laser resonator according to Claim ~~4, where 1,~~ wherein said polarization component adjusting device is a birefringent optical element capable of achieving a birefringence effect in accordance with an applied voltage.

9. (Currently amended) A ~~The~~ self-compensating laser resonator according to ~~Claim 4~~ Claim 1, having a Seeder light generating apparatus for making Seeder light incident upon said ~~polarization-polarizing~~ reflecting element, ~~where wherein~~ said ~~seeder-Seeder~~ light is reflected onto an optional path of said laser beam.

10. (Currently amended) A ~~The~~ self-compensating laser resonator according to Claim ~~1 characterized in that,~~ further comprising a beam diameter converting device for converting a beam diameter of a laser beam ~~is provided.~~

11. (Currently amended) A self-compensating laser resonator comprising:

a first reflecting apparatus having a first reflecting surface and a second reflecting surface disposed at a right angle to each other;

a second reflecting apparatus having a third reflecting surface and a fourth reflecting surface disposed at a right angle to each other, said second reflecting apparatus facing said first reflecting apparatus such that the first through fourth reflecting surfaces are facing each other;

a third reflecting apparatus provided between said second and fourth reflecting surfaces, having a fifth reflecting surface and a sixth reflecting surface disposed parallel to, and facing away from, each other;

a laser medium provided between said first and third reflecting surfaces;—and

a light source for exciting said laser medium, ~~wherein;~~
and

a first ridge line formed by the intersection of said first and second reflecting surfaces and being substantially orthogonal to a second ridge line formed by the intersection of said third and fourth reflecting surfaces, ~~where~~

wherein a laser beam emanating from said laser medium travels along an optical path to said first reflecting surface and is successively reflected, along an optical path, by said

first, second, third, fourth, fifth, fourth, third, second and first reflecting surfaces to again enter said laser medium, passes through said laser medium, and is further successively reflected by said third, fourth, first, second, sixth, second, first, fourth, and third reflecting surfaces to once again enter said laser medium,

wherein said laser beam contains a P-polarization and an S-polarization component, said resonator further having a polarizing reflecting element for selectively allowing to pass a first portion of said P-polarization component and a second portion of said S-polarization component, where the non-passed portions are reflected, said polarizing reflecting element positioned in an optical path of said laser beam, and

further having a polarization component adjusting device for dividing said laser beam into said P-polarization component and said S-polarization component at an arbitrary ratio, said polarization adjusting device being positioned in an optical path of said laser beam.

12. (Currently amended) A—The self-compensating laser resonator according to Claim 11, wherein said third reflecting apparatus comprises two reflecting mirrors, each having a single reflective surface, mutually fixed by a holder and disposed such

that the reflecting surfaces are parallel and face in opposite directions from each other.

13. (Currently amended) A—The self-compensating laser resonator according to Claim 11, wherein said third reflecting apparatus comprises a reflecting mirror having a two-sided reflective coating on a transparent substrate.

14. (Currently amended) a—A self-compensating laser resonator comprising:

a first reflecting apparatus having a first reflecting surface and a second reflecting surface disposed at a right angle to each other;

a second reflecting apparatus having a third reflecting surface and a fourth reflecting surface disposed at a right angle to each other, said second reflecting apparatus facing said first reflecting apparatus such that the first through fourth reflecting surfaces are facing each other;

a laser medium having a seventh two-sided reflecting surface on an optical axis of said laser beam between said first and third reflecting surface; ~~and~~

a light source for exciting said laser medium, ~~wherein;~~
and

a first ridge line formed by the intersection of said first and second reflecting surfaces, and being substantially orthogonal to a second ridge line formed by the intersection of said third and fourth reflecting surfaces, where

wherein a laser beam emanating from said laser medium travels along an optical path to said first reflecting surface and is successively reflected, along an optical path, by said first, second, third, fourth, second, first, fourth, third and seventh two-sided reflecting surfaces, is further successively reflected by said third, fourth, first, second, fourth, third, second and first reflecting surfaces to again enter said laser medium, passes through said laser medium and is reflected by said seventh two-sided reflecting surface,

wherein said laser beam contains a P-polarization and an S-polarization component, said resonator further having a polarizing reflecting element for selectively allowing to pass a first portion of said P-polarization component and a second portion of said S-polarization component, where the non-passed portions are reflected, said polarizing reflecting element positioned in an optical path of said laser beam, and

further having a polarization component adjusting device for dividing said laser beam into said P-polarization component

and said S-polarization component at an arbitrary ratio, said polarization adjusting device being positioned in an optical path of said laser beam.

15. (Currently amended) A self-compensating laser resonator comprising:

a first reflecting apparatus having a first reflecting surface and a second reflecting surface disposed at a right angle to each other;

a second reflecting apparatus and having a third reflecting surface and a fourth reflecting surface disposed at a right angle to each other, said second reflecting apparatus facing said first reflecting apparatus such that the first through fourth reflecting surfaces are facing each other;

a laser medium provided between said first and third reflecting surfaces;

a light source for exciting said laser medium; and

an optical component having an eighth two-sided reflecting surface on an optical axis of said laser beam on one end surface thereof provided between second and fourth reflecting surfaces, wherein; and

a first ridge line formed by the intersection of said first and second reflecting surfaces, and being substantially

orthogonal to a second ridge line formed by the intersection of said third and fourth reflecting surfaces, ~~where~~

wherein a laser beam emanating from said laser medium travels along an optical path to said first reflecting surfaces and is successively reflected, along an optical path, by said first, second, third, fourth, eighth two-sided, fourth, third, second and first reflecting surfaces to again enter said laser medium, passes through said laser medium, is further successively reflected, along an optical path, by said third, fourth, first and second reflecting surfaces to be incident on said optical component, and is further successively reflected, along an optical path, by said eighth two-sided, second, first, fourth, and third reflecting surfaces to once again enter the laser medium,

wherein said laser beam contains a P-polarization and an S-polarization component, said resonator further having a polarizing reflecting element for selectively allowing to pass a first portion of said P-polarization component and a second portion of said S-polarization component, where the non-passed portions are reflected, said polarizing reflecting element positioned in an optical path of said laser beam, and

further having a polarization component adjusting device for dividing said laser beam into said P-polarization component and said S-polarization component at an arbitrary ratio, said polarization adjusting device being positioned in an optical path of said laser beam.

16. (Currently amended) A—The self-compensating laser resonator according to Claim 1, wherein said first and second reflecting apparatuses each have two flat reflecting mirrors disposed at a right angle to each other.

17. (Currently amended) A—The self-compensating laser resonator according to Claim 16, wherein said two flat reflecting mirrors disposed at a ~~said~~ right angle to each other are disposed with a gap therebetween and are joined to one another by ~~means of a~~ joining member.

18. (Currently amended) A—The self-compensating laser resonator according to Claim 1, wherein said first reflecting apparatus and said second reflecting apparatus each comprise a prism having two reflecting surfaces disposed at right angles to each other and an incident surface of the laser beam.

19. (Currently amended) A self-compensating laser resonator comprising:

a first prism having first and second reflecting surfaces disposed at right angles to each other and a first incident surface on said first prism, upon which said laser beam is incident;

a second prism having third and fourth reflecting surfaces disposed at right angles to each other and a second incident surface, upon which said laser beam is incident on said second prism, ~~where~~wherein the first through fourth reflecting surfaces face each other, a ninth two-sided reflecting surface on an optical path of the laser beam, ~~where~~wherein said ninth two-sided reflecting surface is on the second incident surface;

a laser medium provided between said first and third reflecting surface;

~~and~~a light source for exciting said laser medium, ~~wherein;~~ and

a ridge line formed by the intersection of said first and second reflecting surfaces, and being substantially orthogonal to a second ridge line formed by the intersection of said third and fourth reflecting surfaces, ~~where~~

wherein a laser beam emanating from the laser medium travels along an optical path to said first reflecting surface and is successively reflected, along an optical path by the first, second, third, fourth, second, first, ninth two-sided,

first, second, fourth, third, second, and first reflecting surfaces to again enter the laser medium, passes through the laser medium, and is further successively reflected along an optical path by the third, fourth, ninth two-sided, fourth and third reflecting surfaces to once again enter the laser medium,

wherein said laser beam contains a P-polarization and an S-polarization component, said resonator further having a polarizing reflecting element for selectively allowing to pass a first portion of said P-polarization component and a second portion of said S-polarization component, where the non-passed portions are reflected, said polarizing reflecting element positioned in an optical path of said laser beam, and

further having a polarization component adjusting device for dividing said laser beam into said P-polarization component and said S-polarization component at an arbitrary ratio, said polarization adjusting device being positioned in an optical path of said laser beam.

20. (Currently amended) ~~A—The~~ self-compensating laser resonator according to Claim 18 ~~characterized in that, wherein~~ said first and second ridge lines of the first and second prisms are eliminated.

21. (Currently amended) A—The self-compensating laser resonator according to claim 19, wherein said first and second ridge lines of the first and second prisms are eliminated.

22. (Currently amended) A—The self-compensating laser resonator according to claim ~~4—characterized in that~~11, wherein said polarization component adjusting device is a half wave plate.

23. (Currently amended) A—The self-compensating laser resonator according to claim ~~6—characterized in that, wherein~~ said polarization component adjusting device is a half wave plate.

24. (Currently amended) A—The self-compensating laser resonator according to claim ~~4—characterized in that~~11, wherein said polarization component adjusting device is a birefringent optical element capable of achieving a birefringence effect in accordance with an applied voltage.

25. (Currently amended) A—The self-compensating laser resonator according to claim ~~6—characterized in that, wherein~~ said polarization component adjusting device is a birefringent effect in accordance with an applied voltage.

26. (Currently amended) A self-compensating laser resonator according to claim ~~4~~ characterized in that 11, wherein a ~~seeder~~ Seeder light generating apparatus for making ~~seeder-Seeder~~ light incident in the optical path of a laser beam reflected from said ~~polarization-polarizing~~ reflecting element is provided.

27. (Currently amended) A self-compensating laser resonator according to claim ~~6~~ characterized in that, further comprising a ~~seeder-Seeder~~ light generating apparatus for making ~~seeder~~ Seeder light incident in the optical path of a laser beam reflected from said ~~polarization-polarizing~~ reflecting element is provided.

28. (Currently amended) ~~A~~ The self-compensating laser resonator according to claim ~~11~~ characterized in that, wherein said first and second reflecting apparatuses each have two flat reflecting mirrors disposed at a right angle to each other.

29. (Currently amended) ~~a~~ The self-compensating laser resonator according to claim ~~28~~ characterized in that, wherein said two flat reflecting mirrors disposed at a right angle to each other are disposed with a gap therebetween and are joined to one another by ~~means of~~ a joining member.

30. (Currently amended) The self-compensating laser of claim 1, wherein the laser beam emanating from said laser medium initially reflects from one of said first or second reflecting surface.

31. (Currently amended) A self-compensating laser resonator comprising:

a first reflecting apparatus having a first reflecting surface and a second reflecting surface disposed at a first predetermined angle to each other and intersecting at a first ridge line;

a second reflecting apparatus having a third reflecting surface and a fourth reflecting surface disposed at a second ~~predetermined~~ predetermined angle to each other and intersecting at a second ridge line, said second reflecting apparatus facing said first reflecting apparatus such that the first through fourth reflecting surfaces are facing each other; and

a laser medium provided between said first reflecting surface and said third reflecting surface; and

a light source for exciting said laser medium,

wherein the first ridge line is substantially orthogonal to the second ridge line where a laser beam emanating from said laser medium travels along an optical path to said first

reflecting surface and is successively reflected, along an optical path, by said first, second, third, fourth, second, first, fourth and third reflecting surfaces to again enter said laser medium, said laser medium being positioned with respect to said first and second reflecting apparatus so that three reflections occur without the laser beam emitted therefrom passing through the laser medium,

wherein said laser beam contains a P-polarization and an S-polarization component, said resonator further having a polarizing reflecting element for selectively allowing to pass a first portion of said P-polarization component and a second portion of said S-polarization component, where the non-passed portions are reflected, said polarizing reflecting element positioned in an optical path of said laser beam, and

further having a polarization component adjusting device for dividing said laser beam into said P-polarization component and said S-polarization component at an arbitrary ratio, said polarization adjusting device being positioned in an optical path of said laser beam.